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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/940,887	08/29/2001	Masaya Adachi	A8319.0007/P007	5625

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EXAMINER
ROY, SIKHA

ART UNIT	PAPER NUMBER
2879	

DATE MAILED: 02/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/940,887	ADACHI ET AL.	
	Examiner	Art Unit	
	Sikha Roy	2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 August 2001* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) _____ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-21* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *29 August 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *2,4* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Specification

The disclosure is objected to because of the following informalities:

Page 12 line 14, 'phase late' should be replaced by --phase plate--.

Page 26 line 15 'observer 1000' should be replaced by --observer 10000--.

Appropriate corrections are required.

The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim 3 is objected to because of the following informality:

Page 79 line 7 'linarly' should be replaced by --linearly--.

In claim 19, page 84 line 3 'claim 4' should be changed to --claim 1--.

Appropriate corrections are required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 09-127885 to Asai in view of U. S. Patent 5,928,801 to Broer et al.

Regarding claim 1 Asai discloses (Fig.1) a light emitting device comprising a reflective element 1 (reflecting metal cathode), an emissive layer 5, a phase plate 23 and a polarizer 11 formed in this order. Light emitted from the emissive layer includes wavelength range of 460-660 nm, narrower than the visible wavelength range and is directed towards the polarizer. The reflective element is a reflecting surface for reflecting perpendicularly incoming circularly polarized light into one with opposite direction of rotation.

Claim 1differs from Asai in that Asai does not exemplify the polarization separator provided in between the emissive layer and the phase plate.

Broer et al. in analogous art of electroluminescent display system disclose (column 2 lines 14-31, column 5 lines 49-55 Fig.1) a polarization separator (reflective polarizer) 11 provided between the emissive layer 5 and phase plate 15. The light which is passed by the emissive layer and which will generally be unpolarized will be split up into two beam components having complementary states of polarization, one beam component will be passed by the separator and coupled out of the illumination system whereas the other component will be reflected back into the illumination system in which it will have a chance of being converted into light having desired state of polarization. Broer et al. further note (column 3 lines 5-9) that a polarization separator (reflective polarizer) has the advantage that substantially no light is absorbed but the light originally having unwanted state of polarization is recuperated so that greater part can be converted into light having desired state of polarization providing enhanced light output and brightness.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to include the polarization separator as taught by Broer et al. in between the emissive layer and the phase plate of the display device of Asai so that no light emitted from the emissive layer is absorbed, resulting in enhanced brightness of the display.

Regarding claim 2 Asai discloses the phase plate 23 is a quarter wave plate and Broer et al. disclose (column 3 lines10-15) the polarization separator (reflective polarizer) is a cholesteric polarizer comprising layer of liquid crystalline material with a cholesteric ordering.

Claim 3 recites essentially the same limitation as of claim1 with the exception of the polarization separator reflects linearly polarized light components and it is provided between the phase plate and polarizer. Broer et al. disclose (column 4 lines 8-15) an illumination system having the polarizer separator (reflective polarizer) a linear polarizer. The beam components being linearly polarized the quarter waveplate can be dispensed with and hence the polarization separator is provided between the phase plate and the polarizer.

Referring to claim 4 Asai discloses in Fig.22 the emissive layer comprising organic thin film of phenanthrene, perylene, butadiene, coumarin sandwiched between an optically transparent electrode 5 with ITO and a reflective metal electrode 1 with Mg, MgAg, aluminum serving as reflective element.

Referring to claim 5 Asai discloses in Figs. 17 and 24 the light emitting display comprising plurality of light emitting devices arranged in a matrix form and a current control circuit 31 for controlling light emitting operations.

Claim 6 recites essentially the limitations of claims 1,4 and 5 and hence is rejected for the same reasons (see rejection of claims 1,4 and 5).

Claim 7 recites the same limitation as of claim 2 and hence is rejected for the same reason (see rejection of claim 2).

Regarding claim 8 Asai discloses emissive layer comprising different organic light emitting films so that light emission color (red, blue or green) varies depending on the pixel. Broer et al. disclose the reflective wavelength of the polarization separator matches with the color of the incident light and hence the wavelength of the reflected component from the polarization separator differs depending on the light-emission color of the pixel.

Referring to claim 12 Broer et al. disclose (column 5 lines 55-60) that the polarization separator is adapted in such a way that the beam component having the state of polarization which is desirable for the picture display panel is passed. Hence the wavelength range of emission color coincides with the reflective wavelength of the polarization separator.

Regarding claims 13 and 14 Broer et al. disclose (column 3 lines 33-37) that the cholesteric polarizer comprising narrow band cholesteric layer has a polarizing effect in a limited wavelength range so that the polarized light will have a color in conformity with this wavelength range. Therefore it would have been obvious to one of ordinary skill in the art to specify the half-value width of the light-emission wavelength of the emissive layer coinciding with the half-value width of the reflective wavelength of the polarization separator (claim 13) or the center wavelength of the light-emission wavelength of the

emissive layer coinciding with the center wavelength of the reflection of the polarization separator (claim 14) for accurate color conformity.

Regarding claim 15 Broer et al. disclose (column 3 lines 40-45) the polarization separator within which the pitch of the molecular helix varies between two values which correspond to lower and upper limit of the wavelength of the reflection band. Therefore it would have been obvious to one of ordinary skill in that art at the time of invention to include the lower and upper limits of the reflective wavelength set at a range narrower than the light-emitting wavelength range of the emissive layer for color purity from the display.

Claim 16 essentially recites the same limitations as of claims 14 and 15 and hence is rejected for the same reason.

Referring to claim 17 Asai discloses (Fig. 20) the organic electroluminescent device formed on a substrate 42a and the polarizer formed on a second transparent substrate 42b.

Regarding claim 18 Asai discloses (Fig. 18) a display where no substrate exists between the emissive layer and the polarizer.

Regarding claim 19 Asai discloses an insulation layer of SiO_2 formed on the transparent electrode as a mask for protecting the organic layered product underneath. It is also known in the art to provide a layer of insulating and planarizing material (as evidenced by U.S. Patent 5,705,285 to Shi et al. Fig.1 layer 20) on top of the light influencing element to provide a relatively smooth surface and protect the organic electroluminescent device.

Regarding claim 20 Asai discloses (Figs. 12-15) partition provided in the non-light emitting portion so that when the organic EL element emits light the display has a good color purity, the portion of the circumference of a luminescent portion non-emitting light looked black.

Claims 9,10,11 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 09-127885 to Asai and U. S. Patent 5,928,801 to Broer et al. and further in view of 'Cholesteric Reflectors with a Color Pattern' by Maurer, Kreuzer, Stohrer, SID 94 Digest pp 399-402.

Claim 9 differ from Asai and Broer et al. in that Asai and Broer et al. do not exemplify pattern-formed polarization separator at positions corresponding to pixels of different color of light emission from the emissive layer.

Maurer et al. disclose (page 399 abstract, introduction) polarization separators (cholesteric liquid crystals) can be patterned with different colors by photolithographic process. Different reflection colors can be achieved by the thermochromic effect of cholesteric liquid crystals.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to modify the polarization separators of Asai and Broer being pattern-formed with different colors as suggested by Maurer et al. for reflecting red, green and blue corresponding to emission colors in the pixels thus forming a color display.

Regarding claim 10 it is well known in the art to use black matrix layers between patterns of different colors for achieving color purity. Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to form the polarization

separators of Asai and Broer et al. patterned in a matrix form corresponding to light-emitting regions of emissive layer, patterns being separated by black matrix.

Regarding claim 11 it would have been obvious to have the aperture of the black matrix wider than the light-emitting regions in order to ensure color purity of a pixel.

Regarding claim 21 Maurer et al. disclose use of different color filters close to cholesteric liquid crystal polarizer for efficient emission of a particular color. Therefore it would have been obvious to one of ordinary skill in the art to include pattern-formed color filters for transmitting particular color as suggested by Maurer et al. corresponding to pattern-formed polarization separators of Asai and Broer et al. for producing white light resulting from combination of red, green and blue colors from different pixels.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following prior art references are cited to further show the state of the art with respect to display device provided with light separating element.

U. S. Patent 5,587,816 to Gunjima et al.

U. S. Patent 5,712,694 to Taira et al.

U. S. Patent 6,118,504 to Iijima et al.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sikha Roy whose telephone number is (703) 308-2826. The examiner can normally be reached on Monday-Friday 8:00 a.m. – 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimeshkumar D. Patel can be reached on (703) 305-4794. The fax phone number for the organization is (703) 308-7382.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

S.R

Sikha Roy
Patent Examiner
Art Unit 2879

ASHOK PATEL
PRIMARY EXAMINER